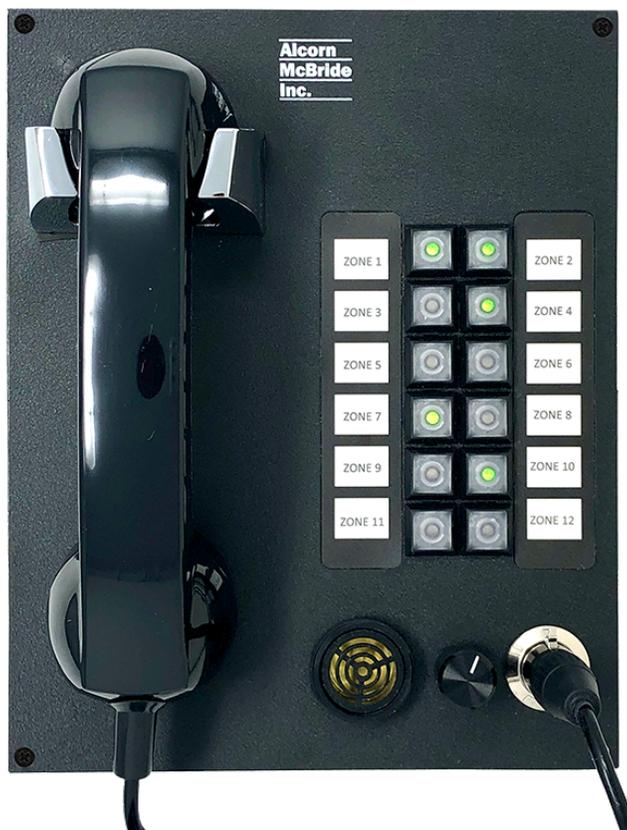


**Alcorn
McBride
Inc.**

V-Com VCI2X

12-ZONE INTELLIGENT INTERCOM STATION



User's Guide

April 23, 2021

TABLE OF CONTENTS

TABLE OF CONTENTS	2
WELCOME!	4
PRODUCT FEATURES	5
TECHNICAL SUPPORT	5
GETTING STARTED - VCI2X	6
HARDWARE INSTALLATION.....	6
LINKING A NEW V-COM AND Q-SYS CORE TOGETHER.....	6
AUDIO CONFIGURATION	6
HARDWARE INFORMATION	7
HARDWARE OVERVIEW	7
ZONE STATUS LEDs.....	8
CONFIGURATION OF DIP SWITCHES	8
CONNECTORS.....	11
NETWORK ARCHITECTURE	13
Q-SYS CONFIGURATION AND PLUGINS	15
INTERCOM MATRIX PLUGIN PROPERTIES.....	16
INTERCOM MATRIX PLUGIN INTERFACE	17
INTERCOM STATION PLUGIN PROPERTIES	19
INTERCOM STATION PLUGIN INTERFACE	20
LINKING STATION TO Q-SYS.....	24
NETWORK AUDIO CONFIGURATION	25
AES67 FLOW CONFIGURATION	25
AES67 AUDIO ROUTING	26
FIRMWARE UPDATE	30
FIRMWARE UPDATE PROCEDURE.....	30
TROUBLESHOOTING GUIDE / FAQ	31

LOCATING A V-COM ON A NETWORK.....	35
ACCESSORIES	36
RM-VC12.....	36
RM-VP4VC12	36
HANDSET-VC.....	37
SPECIFICATIONS.....	37
CONTROL	37
AUDIO	37
PHYSICAL.....	37

WELCOME!

Thank you for purchasing The Alcorn McBride V-Com intercom station!

What makes V-Com truly special is its ability to provide facility-wide intercom using industry-standard Dante or AES67 network audio and the Q-Sys™ ecosystem of DSP cores and software.

The V-Com VC12X is a twelve-button station that comes with a push-to-talk handset, handset hook, sonalert ringer, receiver volume knob, and twelve IP65 rated buttons /w integrated indicators. The station is just the right size for a standard 8" x 10" Hoffman enclosure, making it a fantastic off-the-shelf intercom solution that's ready to go right out of the box. Ring zone assignments, button and indicator behaviors, and intercom party lines are all easily configured within in the Q-Sys Designer and Administrator software.

For easy and reliable installation, a single Ethernet (Cat5e or greater) cable carries audio, power, control and monitor data between the V-Com station and the Q-Sys system. This allows you to incorporate as many as 256 V-Com stations using a single Q-Sys core by simply connecting them to Power Over Ethernet (PoE) network switches. For stations that are far from the equipment room, V-Com even supports an SFP network transceiver (not included) for reliable long-distance communications.

For applications where you wish to build your own custom intercom console, be sure to check out our V-Com VC16K intercom station kit. The V-Com VC16K supports up to 16 ring zone buttons and is designed to be mounted inside a custom console. It includes all of the accessories needed to wire up your custom-installed buttons and indicators.

PRODUCT FEATURES

The V-Com VCI2X offers a wide range of features including:

- 12 Illuminated Ring Zone Buttons
- Dante & AES67 Network Audio
- Seamless Q-Sys Integration
- Audio, Control, and Power over Ethernet
- SFP Ethernet Support
- Magnetic Hangup Sensor
- Customizable Label Inserts
- User-Adjustable Receiver Volume
- Configurable LED Brightness
- Mounts in a Standard 8" x 10" Hoffman Enclosure
- Dust & Water Resistant

TECHNICAL SUPPORT

Now that we've tantalized you with all of the wonderful things this product can do, I'll bet you're chomping at the bit to flip all the switches and push all the buttons. Not so fast! Before we get to the fun stuff, we just want to take a moment to remind you that we are here to help. Chances are that you're building something really cool and we want you to have access to the resources and support you need to be successful.

To start, you'll find a wealth of information on our website. This includes Application Notes that give you detailed documentation and examples for how this product is used in common types of themed entertainment projects. You'll also find the latest downloads for software, firmware, drawings, 3D models, cutsheets, and other helpful resources on our Support page. The Knowledge Base is especially handy for common questions and helpful troubleshooting tips. And last, but certainly not least, you always have our friendly and mildly entertaining staff available by email or telephone.

Training	https://www.alcorn.com/training
Application Notes	https://www.alcorn.com/applications
Support Resources	https://www.alcorn.com/support
Knowledge Base (FAQ)	https://alcornmcbride.zendesk.com/hc/en-us
Email Support	support@alcorn.com
Telephone Support	(407) 296-5800 (Mon-Fri 9am-6pm EST)

GETTING STARTED - VC12X

Alright, time to roll up your sleeves and get to work! This section will guide you through basic concepts that will help you get on your way with V-Com.

Each V-Com station communicates with a Q-Sys Core via network connection using a plugin. To install this plugin, you need to download the file from our website (<https://alcorn.com/products/vc12x/>) and copy and paste the component to your design.

***You must be running Q-Sys Firmware 7.0.0 or above and V-Com firmware 2.08 or above for the Plugin to work. To learn how to do a firmware update please refer to the firmware update section of this manual.**

There are three steps that need to be completed to ensure that V-Com and Q-Sys function together properly.

1. Hardware Installation
2. Linking to a Q-Sys Core
3. Audio Configuration

HARDWARE INSTALLATION

- a. Make sure that all the dip switches are in the OFF Position
- b. Power on V-Com by connecting Ethernet port to the Power Over Ethernet (PoE) switch and wait 20 seconds for V-Com unit to initialize. If no Power Over Ethernet (PoE) is available, refer to the VC12X Hardware section to learn about using an external power supply.
- c. Be sure to have your V-Com units on the same network as the Q-Sys Core

LINKING A NEW V-COM AND Q-SYS CORE TOGETHER

- a. Single click the V-Com Plugin block for the station you would like to link and ensure your property settings are configured. (Refer to Plugin Properties section of this manual).
- b. Connect to the Q-Sys Core and then double click to open the plugin.
- c. Press and hold buttons 1, 2 and 4 simultaneously on the V-Com hardware for 5 seconds.
- d. On the Q-Sys plugin, on the top right corner click "Link".

Once the station is linked to the Core the station will re-boot. At this time your plugin will be "Online" and the LED will light up.

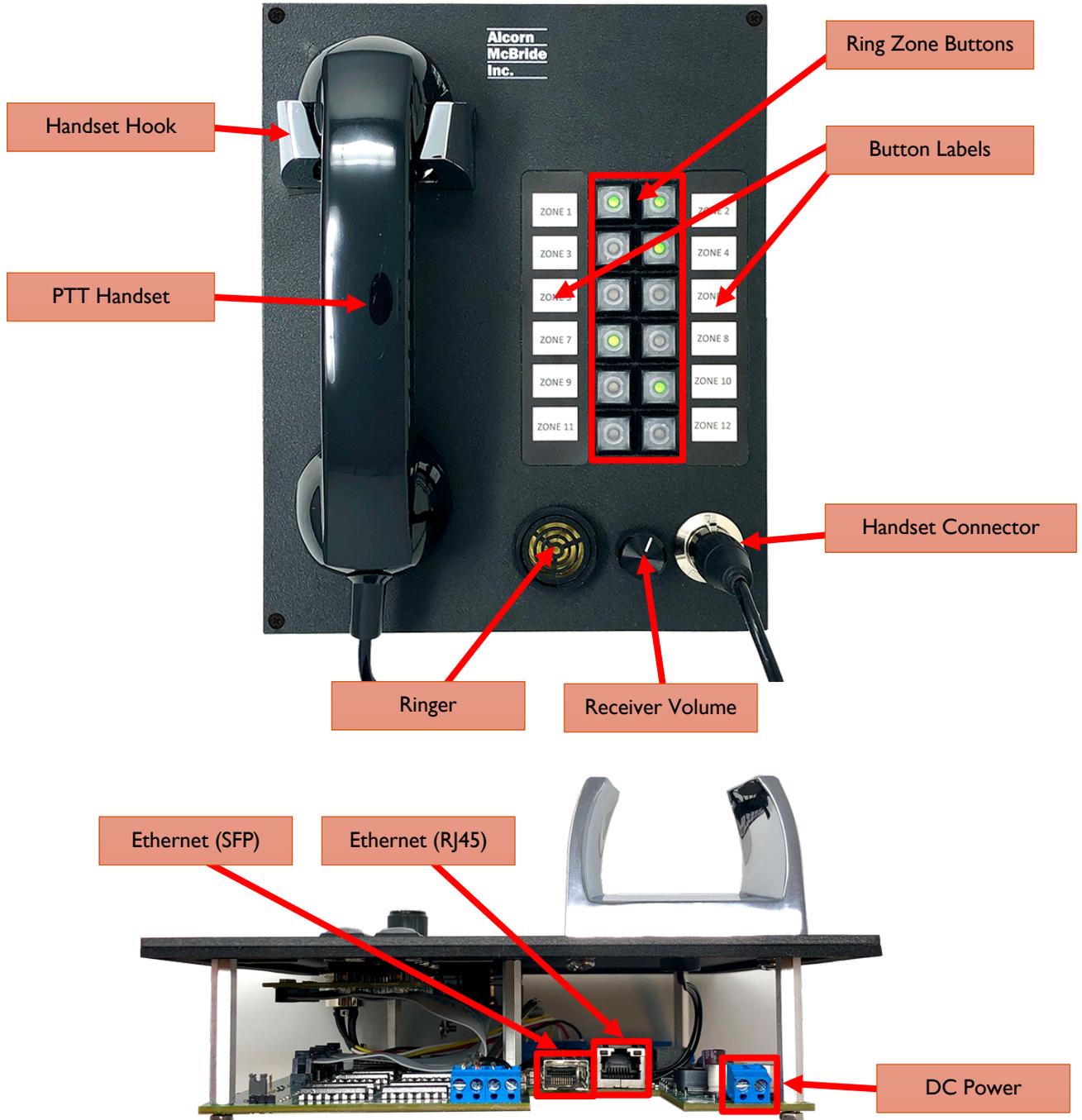
NOTE: Make sure that you have assigned a gateway in the Q-sys core and that your network infrastructure allows for both broadcast and multicast traffic.

AUDIO CONFIGURATION

- a. Launch the Audinate Dante Controller software.
- b. Click on the "Device Info" tab and double click on the V-Com station.
- c. Enable AES67 under the AES67 tab and reboot the interface.
- d. Once the interface has been rebooted, it's time to create an AES67 multicast flow. Click on "Add Multicast Flow".
- e. Check the "AES67 Flow" box. Add your channel into the new flow. Click "Create".
- f. In Q-Sys Designer, double click your AES67 Receiver Module and pick the new Stream Name.

HARDWARE INFORMATION

HARDWARE OVERVIEW



ZONE STATUS LEDS

LED State	Description
Blinking Green	Station Ringing
On	Ring Zone Available
Off	No Ring Zone Assigned
All Chasing (1, 2, 3, ...)	Link Active
All Blinking (Slow)	No Sync – No Q-Sys Core Detected
All Blinking (Rapid)	Firmware Update Mode

NOTE: These indicators can be overridden using the Breakaway feature of the V-Com plugin. This allows you to take manual control of the LED status using IO pins in Q-Sys designer.

CONFIGURATION OF DIP SWITCHES

The configuration DIP switches are located on the side of the V-Com. Changing the states of these switches, either during power-up or normal operation, can alter the behavior of the V-Com. The default position for all the switches for normal operation is OFF (UP).

V-Com can power up in one of the following modes (based on switches configuration):

- Normal Mode
- Factory Test Mode
- Firmware Update Mode

During power up, the state of some switches (ON or OFF) may result in action. During runtime, toggling the DIP switch (OFF => ON => OFF) may perform a specified action. See the descriptions below.



DIP SWITCH 1: LINK MODE

RUNTIME – LINK:

OFF => ON => OFF: Activate/deactivate Link. Toggle once to activate, toggle again to deactivate. Link will also exit on successful completion or will auto-exit after 60 seconds (default).

Link can be used in conjunction with Q-Sys to assign station ID, static IP/Port and Q-Sys feedback information to the V-Com. In a sense, this pairs the V-Com with a specific Q-Sys Core.

When the Link mode is active, LEDs will illuminate one at a time in a sequential chasing pattern.

DIP SWITCH 2: FIRMWARE UPDATE MODE / RESET FACTORY DEFAULTS

POWER UP – FIRMWARE UPDATE MODE:

ON: Enter Firmware Update mode. In this mode of operation, V-Com disregards all its settings and the rest of the DIP switches and uses a default IP of 192.168.0.254. Web server serves up Firmware Update page. For a detailed explanation on Updating V-Com firmware, see the Firmware Update section.

To exit Firmware Update Mode, return the switch to OFF position and perform a power cycle.

OFF: Default state of the switch for normal operation.

NOTE: It's advised to use AMI Terminal to invoke the firmware update. The V-Com will enter the firmware update mode on the last known IP instead of fixed 192.168.0.254

RUNTIME – LOAD FACTORY DEFAULTS (IN NORMAL OPERATION MODE ONLY):

OFF => ON => OFF: Perform factory defaults. All LEDs will light up solid RED for a few seconds, then V-Com will perform reset to defaults. Any stored settings will be erased from non-volatile memory and restored to their factory defaults. This affects Dante settings as well.

NOTE: Loading Factory Defaults will erase all V-Com settings!!

DIP SWITCH 3: FACTORY TEST MODE

POWER UP – FACTORY TEST MODE:

ON: Used for Factory Testing purposes only.

OFF: Default state of the switch for normal operation.

NOTE: Firmware Update DIP Switch 2 must be OFF!

NOTE: Factory Test Mode is mainly used for troubleshooting. It is NOT a requirement to program the V-Com as all the parameters can be programmed while operating in the normal mode.

NOTE: While in Test Mode, V-Com will not fully operate as a paging station.

DIP SWITCH 4: SPARE (NOT IN USE)

This DIP Switch is currently not in use.

POWER UP/RUNTIME:

ON: Not in use.

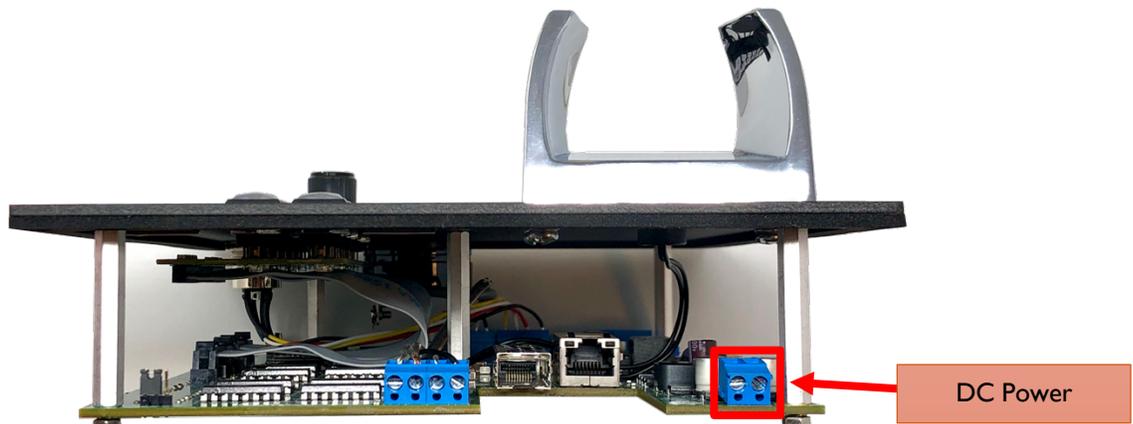
OFF: Default state of the switch for normal operation.

CONNECTORS

POWER INPUT

An external power input is provided if you decide not to use the Power-Over-Ethernet (POE) feature. The Power connector pinout is shown circled in red below.

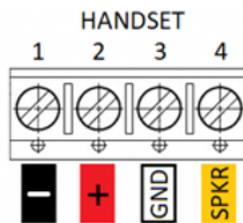
The power input accepts 5VDC to 37VDC at 1A Max.



HANDSET

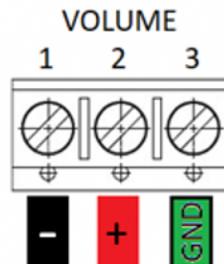
The handset connector pinout is shown below. Pin numbers are also printed on the PCB.

This connector is designed specifically to terminate a panel-mount male 4-pin XLR connector that connects to our V-Com Handset (HANDSET-VC).



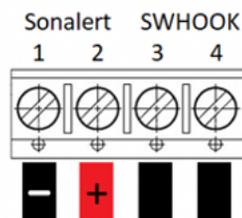
VOLUME

The Volume connector pinout is shown below. Pin numbers are also printed on the bottom of the PCB. The volume control is not used for intercom applications.



SONALERT RINGER & HANDSET HOOK

The Sonalert Ringer and Handset Hook connector pinout is shown below. The input labeled SWHook is where the Hang-up Sensor is connected. Pin numbers are also printed on the PCB.



NOTE: The Handset Hook sensor is a contact closure so wiring polarity is irrelevant. Be sure to observe the + and – labels on the Sonalert when wiring to this connector.

ETHERNET (RJ45)

A standard RJ-45 Ethernet Jack is used for the network connection and Power Over Ethernet (PoE) power.

ETHERNET (SFP)

A small form factor pluggable (SFP) transceiver connector is available to provide support for a fiber-optic alternative to the RJ45 port. Both Single-Mode and Multi-Mode modules are compatible. Make sure that the same SFP module model is used on both ends of the fiber optic connection to ensure compatibility.

NETWORK ARCHITECTURE

V-Com is part of a system consisting of a Q-Sys Core, network hardware, and the V-Com stations themselves.

A single network connection handles both control and audio transport this connection can either be via CAT5e Ethernet cables or Single-Mode/Multi-Mode Fiber Ethernet cables if the length exceeds 300 ft.

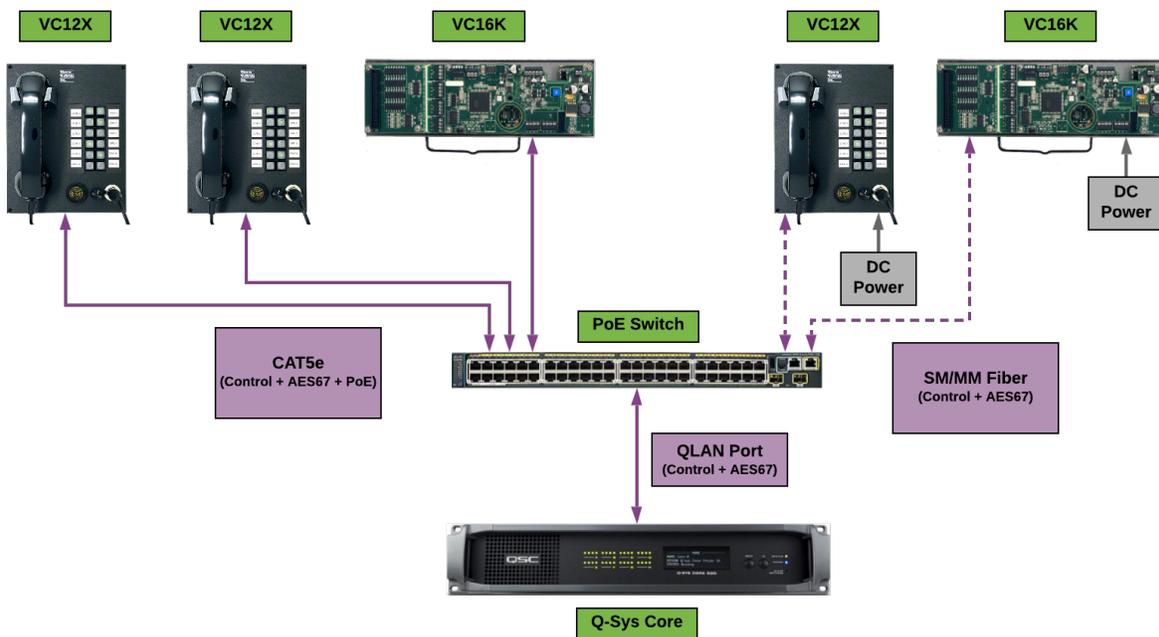
When using CAT5e, power can be provided directly over the Ethernet connection via PoE. Since the SFP connection is not capable of providing power, a local DC power supply is required whenever you're using this interface for a fiber-based Ethernet connection.

One important thing to understand is that each V-Com station has two network interfaces that are switched into a single physical port; one for Control and the other for Network Audio (Dante or AES67). Also, Q-Sys cores handle AES67 and Dante very differently. AES67 can be utilized on the same network as Q-Lan, while Dante requires a dedicated Dante IO card to be installed within the Q-Sys core.

With all of these factors in mind, here are the network architectures we recommend depending on which audio network protocol you choose to use.

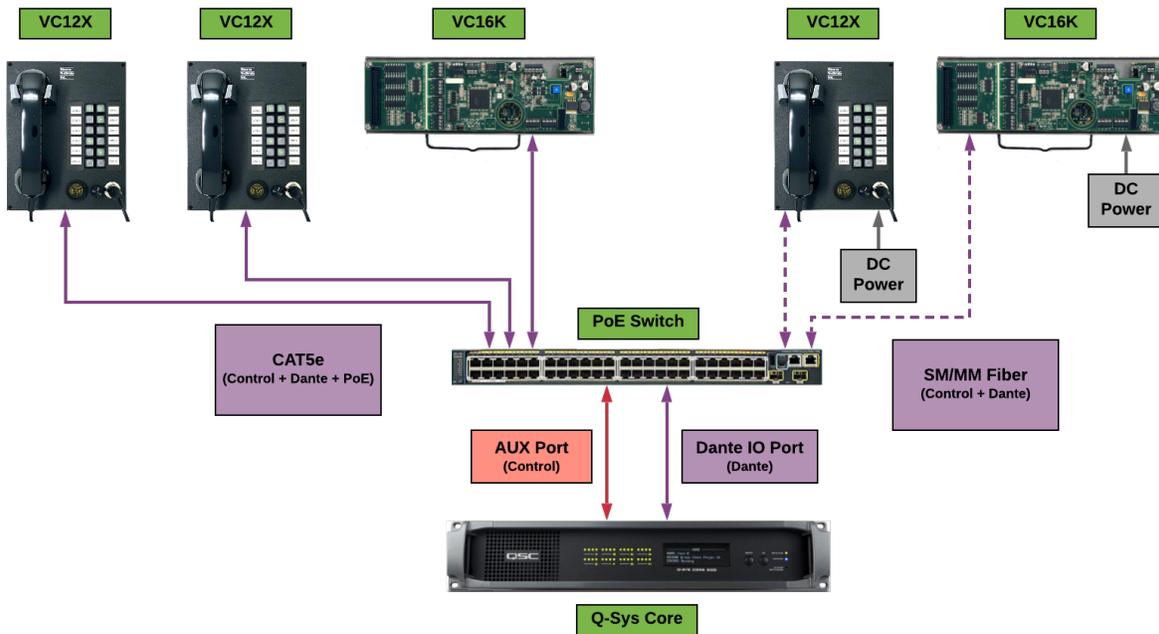
AES67 NETWORK ARCHITECTURE

The biggest advantage of using AES67 is that it co-exists peacefully with the native Q-Lan protocol used by Q-Sys DSP cores. This means that you can interface to both the audio and control interfaces of the V-Page stations simply by connecting one of the Q-Lan ports to the V-Page network.



DANTE NETWORK ARCHITECTURE

This is the recommended method where Dante Audio and Control are using the same network switch. Q-Lan and Dante require a different QoS configuration while the AUX Network of the Q-Sys core acts as a generic ethernet port. This makes the AUX connector the ideal path to interface to the Control interface of the V-Page stations. Dante traffic must be routed to a separate network connection on the Dante IO card within the Q-Sys core.



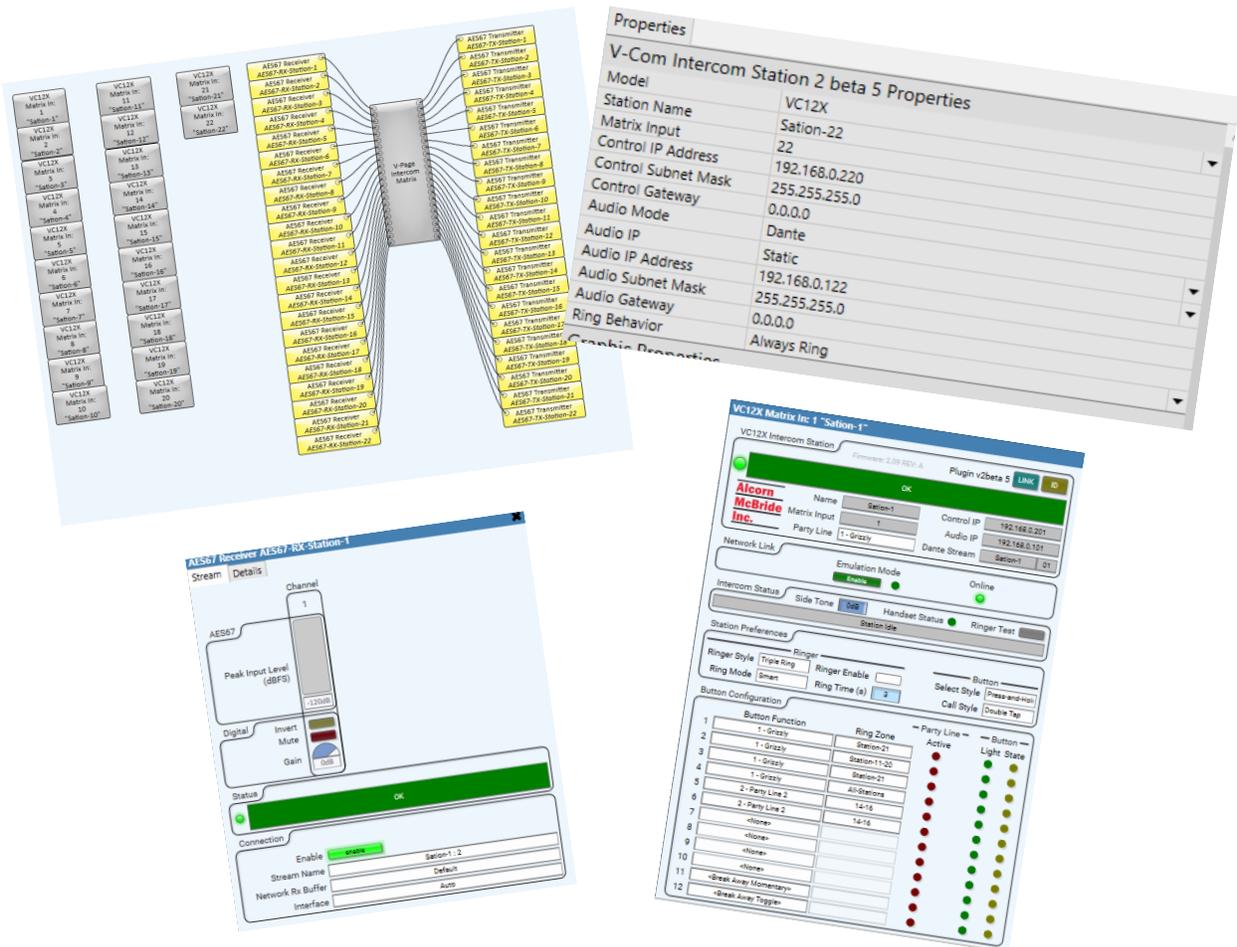
Q-SYS CONFIGURATION AND PLUGINS

V-Com communicates with a Q-Sys system to enable ring zones, configure party lines, etc. This is accomplished using both the V-Com Intercom Matrix plugin along with the V-Com Intercom Station plugin.

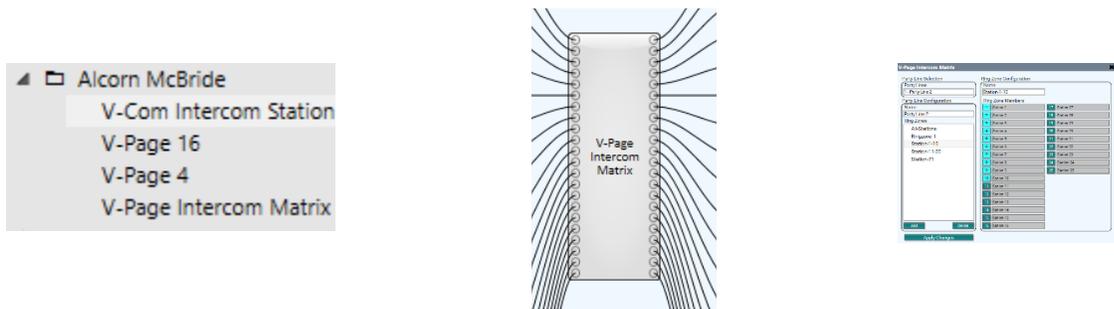
The V-Com Intercom Station plugin is used to configure all of the properties of a specific station, which are then transferred to the physical station when it is “Linked” to the Q-Sys Core.

The V-Com Intercom Matrix plugin is a logical block that lives within Q-Sys that is used to configure all party lines and ring zones. All party lines and zones can be given descriptive names so that each intercom station can be assigned to these groups. Once the system is active, the Intercom Matrix plugin properly routes audio from each station to the appropriate party line while also managing all ring zone control.

Note: All Dante devices use PTP for clock synchronization and require Q-Sys core's PTP config to be set to domain 0. IEEE 1588 Priority 1 is set to 249 and Priority 2 is set to 112 for BMC purposes. PTP information (domain, priorities, etc) are not configurable in the units.



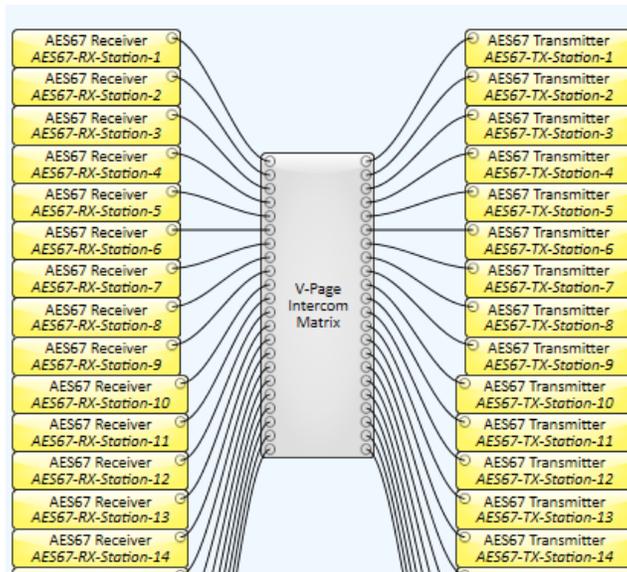
INTERCOM MATRIX PLUGIN PROPERTIES



Properties	
V-Page Intercom Matrix v0.9.1 Properties	
Party Lines	3
Stations	25
PL Isolation	Yes

- **Party Lines:** The user can select how many party lines the system will have.
- **Stations:** The number of stations that the system will have.
- **PL Isolation:** Defines if the Party Line audio will be only heard on to the selected Party Line by the station or if you will be able to hear any station no matter on what Party Line the station is currently on.

INTERCOM MATRIX PLUGIN INTERFACE



V-Page Intercom Matrix [Close]

Party Line Selection

Party Lines
1 - Party Line 1

Party Line Configuration

Name
Party Line 1

Ring Zones

- All-Stations
- Ringzone 1
- Station-1-10
- Station-11-20
- Station-21

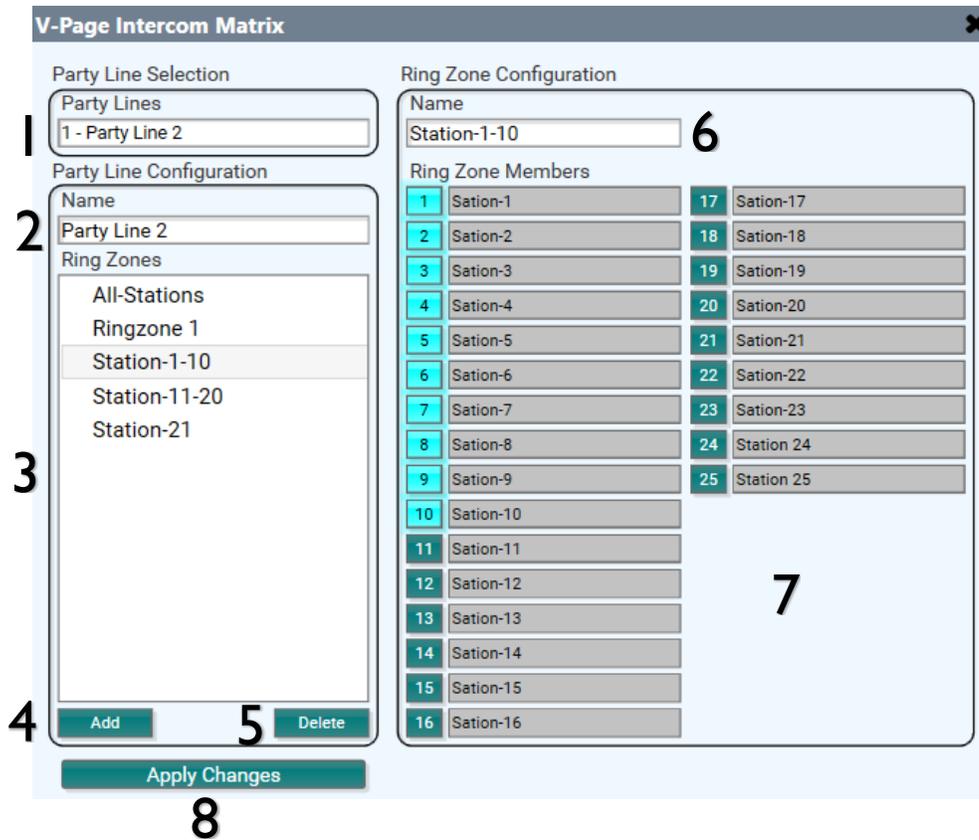
Add Delete

Ring Zone Configuration

Name
Station-1-10

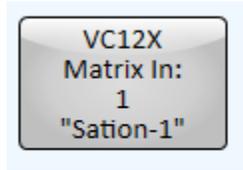
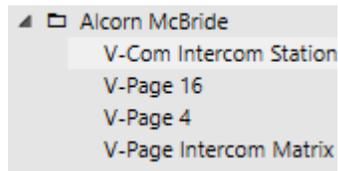
Ring Zone Members

1	Station-1	17	Station-17
2	Station-2	18	Station-18
3	Station-3	19	Station-19
4	Station-4	20	Station-20
5	Station-5	21	Station-21
6	Station-6	22	Station-22
7	Station-7		
8	Station-8		
9	Station-9		
10	Station-10		
11	Station-11		
12	Station-12		
13	Station-13		
14	Station-14		
15	Station-15		
16	Station-16		



1. **Party Line selection:** Drop-down menu shows available Party Lines. The number of available Party Lines is set in design mode under the Intercom Matrix properties.
2. **Party Line Name:** User defined name for the party line.
3. **Ring Zones:** Shows any Ring Zones created for the selected Party Line.
4. **Add:** Use to create new Ring Zones.
5. **Delete:** Removes the selected Ring Zone.
6. **Ring Zone Name:** User defined name for the selected Ring Zone.
7. **Ring Zone Members:** Assigns the selected stations to the currently selected ring zone. The station(s) that have a number light up will ring when that Ring Zone is called. The list will auto-populate from any station that has been assigned at the station plugin.
8. **Apply Changes:** Must be pressed to save any changes, otherwise the changes will be lost if the block is closed.

INTERCOM STATION PLUGIN PROPERTIES



Properties	
V-Com Intercom Station Properties	
Model	VC12X
Matrix Input	1
Station Name	Load
Control IP Address	192.168.1.86
Control Subnet Mask	255.255.255.0
Control Gateway	192.168.1.1
Audio Mode	AES67
Audio IP	Static
Audio IP Address	192.168.1.87
Audio Subnet Mask	255.255.255.0
Audio Gateway	192.168.1.88
Ring Behavior	Always Ring
Show Debug	No

- **Model:** The user can select the proper model number of each station.
- **Matrix Input:** The input number to the Intercom Matrix.
- **Station Name:** User defined name of each station. Allowed Characters: numbers, letters, and dashes. Do not leave blank spaces.
- **Control IP Address:** The IP address of the network control of the unit entered by the user or fully populated once an IP is being assigned by a switch in DHCP mode.
- **Control Subnet Mask:** The subnet mask of the control network of the unit.
- **Control Gateway:** The gateway settings of the control network.
- **Audio Mode:** User defined setting if hardware allows it. Can either be Dante or AES67.
- **Audio IP:** The IP address of the audio network of the unit entered by the user or fully populated once an IP is being assigned by a switch in DHCP mode.
- **Audio Subnet Mask:** The subnet mask of the audio network of the unit.
- **Audio Gateway:** The gateway settings of the audio network.
- **Ring Behavior:** Defines how when will the station ring based on the Handset state
- **Show Debug:** Puts the VCom plugin into debug mode for troubleshooting purposes.

INTERCOM STATION PLUGIN INTERFACE

Here's how the main intercom plugin user interface looks:

V-Com VC12X Matrix Input: 1 Load 192.168.1.86

VC12X Intercom Station Firmware: v2.15.00 Plugin v2.15.00 **LINK** **ID** **Reboot**

OK

Alcorn McBride Inc. Name Control IP
 Matrix Input Audio IP
 Party Line AES67 Stream

Network Link Emulation Mode **Enable** Online

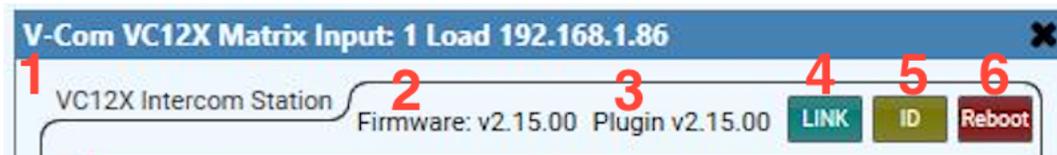
Intercom Status Side Tone Handset Status Ringer Test

Station Preferences Ringer Ringer Style Ring Time (s) Ringer Enable

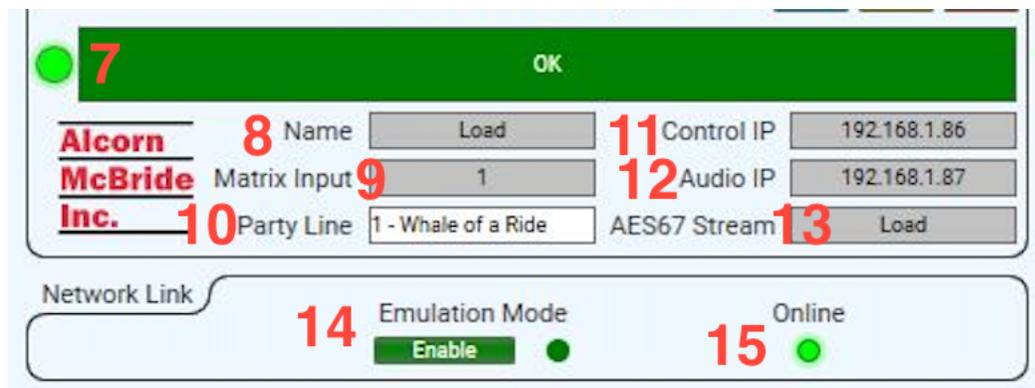
Button Configuration

	Button Function	Ring Zone	Party Line Active	Button Light State
1	<input type="text" value="1 - Whale of a Ride"/>	<input type="text" value="Unload"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2	<input type="text" value="1 - Whale of a Ride"/>	<input type="text" value="All"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
3	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
4	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
5	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
6	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
7	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
8	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
9	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
10	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
11	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
12	<input type="text" value="<None>"/>	<input type="text" value=""/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>

1. **Title Bar:** Basic plugin information. A quick glance at the station type, matrix input number, and control IP address.
2. **Firmware:** VCom Station firmware version.
3. **Plugin:** VCom Plugin version.
4. **Link:** Use this button to associate a physical station with the plugin component (refer to “Linking a Station” section on the next page).
5. **ID:** Pressing the Link button will make the indicators of the V-Com station blink momentarily
6. **Reboot:** Pressing the Reboot button will make the VCom station soft reboot.



7. **Status Bar:** A graphic representation of an active VC12X hardware. (Red: Disconnected. Green: Connected) New with Plugin v2.15.00, this bar will also indicate if you have a firmware/plugin mismatch.
8. **Station Name:** You can give the station a unique descriptive name to differentiate from other V-Com stations.
9. **Matrix Input:** The Matrix Input, corresponding to the station number on the Intercom Matrix Router.
10. **Party Line:** Assigns the station to a Party Line, also referred as “Home Party Line”
11. **Control IP Address:** The IP Address of the V-Com station.
12. **Audio IP Address:** The IP Address of the audio stream.
13. **Audio Stream Name:** The type of digital audio stream used (Dante or AES67).
14. **Emulation Mode:** Allows the plugin and V-Com station to be used without a core for programming purposes.
15. **Online:** LED is on if the V-Com station is currently connected to the Core.



16. **Intercom Status Bar:** Indicates whether the station is idle or currently in use.
17. **Side Tone:** Set the audible level of the station's microphone sent back to itself.
18. **Handset Status:** On: When the handset is picked up (off the hook), Off: when the handset is on hook.
19. **Ringer Test:** Activates the sonalert ringer in the station. Duration and style is based on selected ringer settings
20. **Ringer Style:** Set the station's ring behavior when called: "Continuous", "Double Ring" or "Triple Ring".
21. **Ring Time:** Sets how long the station will ring for when called, in seconds.
22. **Ringer Enable:** Enables or disables the stations sonalert ringer.



23. **Button Function:**
- None:** No function assigned to the button.
 - Party Line Select:** Select from the drop-down menu which Party Line you want to be on when the station's button is pressed. Party Lines are configured through the Intercom Matrix Plugin.
 - Break Away Toggle:** When pressed, the control pin "LED" will toggle states. ON, OFF (01), (10). This can be used to interface to other control pins within Q-Sys like mute functions. In this mode, the button LED will represent the state of the 'State LED' control pin.
 - Break Away Momentary:** This is like the toggle mode except that the control pin "State LED" will momentarily pulse to a value of 1 and then go back to 0. In this mode, the V-Com button LED can be manually controlled using the control pin "Input LED".
24. **Ring Zone:** Select from the drop-down menu what stations will ring when the button is called. Stations are assigned to Ring Zones through the Intercom Matrix Plugin.
25. **Active:** LED will light up when the Party Line is in use.
26. **Button Light:** Will replicate the current condition of the button. In Breakaway mode, the LED is controlled by the "Light Input" Control pin.
27. **Button State:**
- Break Away Toggle:** When pressed, the control pin "LED" will toggle states. ON, OFF (01), (10). This can be used to interface to other control pins within Q-sys like mute functions. In this mode, the button LED will represent the state of the 'State LED' control pin.
 - Break Away Momentary:** This is like the toggle mode except that the control pin "State LED" will momentarily pulse to a value of 1 and then go back to 0. In this mode, the V-Com button LED can be manually controlled using the control pin "Input LED".

Button Configuration		Party Line	Button
23 Button Function	24 Ring Zone	25 Active	26 27 Light State
1 1 - Whale of a Ride	Unload	●	● ●
2 1 - Whale of a Ride	All	●	● ●
3 <None>		●	● ●
4 <None>		●	● ●
5 <None>		●	● ●

LINKING STATION TO Q-SYS

Your Q-Sys design must contain the several elements in order for the V-Com system to work; one V-Com Station plugin for each physical station, a V-Com Intercom Matrix plugin, and your audio receiver(s) and transmitter(s). Each V-Com station can transmit and receive a single digital audio signal via Dante and AES67 stream.

Once your design is ready to be tested simply “Save to Core and Run”. With your V-Com powered on and the zone buttons blinking, press and hold inputs 1,2, and 4 until a continuous scan sequence start on your V-Com unit. If you do not have inputs 1, 2, and 4 wired to buttons, you may instead use the ‘Link’ DIP switch to get the VC12X into link mode as well. More on this can be read in the DIP SWITCH 1: LINK MODE section of this manual.

Once your V-Com is in Link Mode, double-click on the plugin block and press LINK.

Remember: When adding additional V-Com stations to your system, don’t forget to give the new station a unique ID and IP address.

Congrats! Your V-Com control has been set and you should be able to test your control functions.

ADDING PREVIOUSLY PROGRAMMED V-COM STATIONS TO A NEW DESIGN

If you need to reprogram a V-Com station, toggle DIP Switch 2 to the “On” then “Off” position. This will reset the station into Factory Default Mode.

NETWORK AUDIO CONFIGURATION

Audinate's Dante Controller will allow you to see all your Dante devices within the network and enable the use of AES67 audio stream. Q-Sys control and AES67 can travel through the same physical cable; however, if Dante audio stream is preferred a separate Dante I/O card must be installed in your Q-Sys Core system.

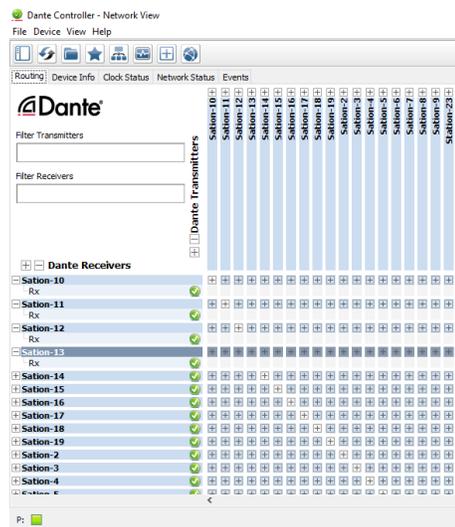
You can download the Dante audio network configuration software, Dante Controller, here: <https://www.audinate.com/products/software/dante-controller>

This webpage also contains instructions on how to use the application.

AES67 FLOW CONFIGURATION

For the stations to transmit AES67 signal through your network, we must enable the functionality using Dante controller.

1. Open Dante controller and double click on a station from the list
2. Go to the "AES67 Config" tab and select "enabled", then click reboot.



3. Click on the network flows icon  select "AES67 Flow" and "Add New Flow". Then click "Create" at the bottom. The station is now AES67 Enabled and will be available in the Q-Sys AES67 Receiver in the "Stream Name" drop-down menu.

 Create Multicast Flow ✕

Station-15 supports up to 1 channels per flow.

Select one or more transmit channels to be placed in multicast flows.

AES67 Flow

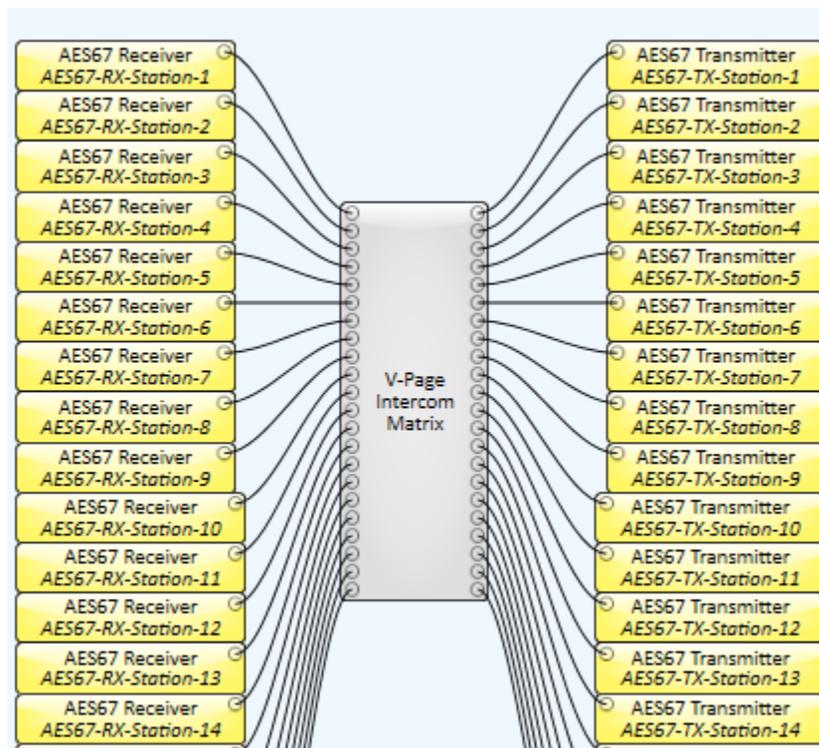
Channel Name	Add to New Flow
Tx	<input checked="" type="checkbox"/>

AES67 AUDIO ROUTING

Your design should contain an AES67 receiver and an AES67 Transmitter in order to run digital audio from the V-Com through your design and back to the station.

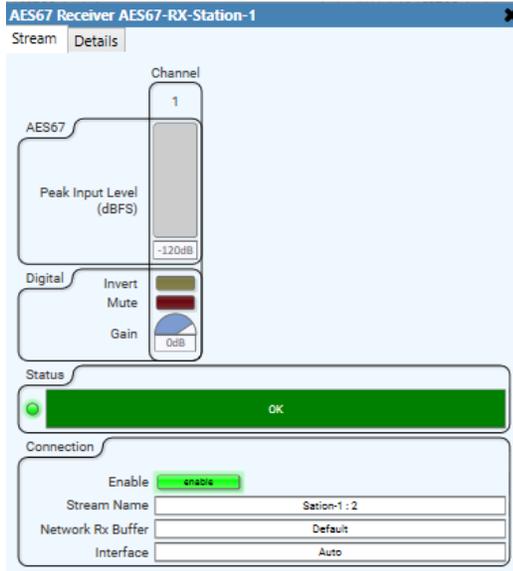
An AES67 Receiver per station should be previously added into the inventory tab by selecting the + sign and choosing an AES67 Receiver under the Streaming I/O sub menu. Drag and drop into your Q-SYS designer page an AES67 Receiver, connect a wire from Output 1 to Input 1 of the V-Com Intercom Matrix.

An AES67 Transmitter per station should be previously added into the inventory tab by selecting the + sign and choosing an AES67 Receiver under the Streaming I/O sub menu. Drag and drop into your Q-SYS designer page an AES67 Receiver, connect a wire from Output 1 to Input 1 of the V-Com Intercom Matrix.



Next, "Save to Core and Run". Once connected, double click on your recently added AES67 Rx module and choose the stream name, which was set when you linked the station.

AES67 RECEIVER

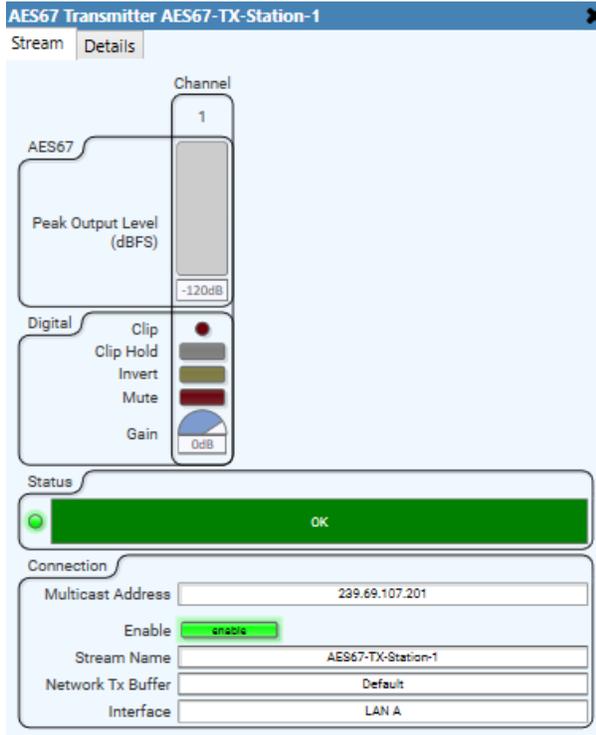


In the AES67 Receiver you will need to fill the following settings

1. **Enable:** used to turn the receiver on or off.
2. **Stream Name:** This list will auto populate from the stations in your network that are sending an AES67 Stream. The stream name was set when you linked the station. Select the station's audio that you want to get on that receiver.
3. **Receiver Name:** This setting is done on the properties tab for the component. We recommend using a name that can be easily related to the station that it belongs to.
4. **Interface:** Select which Q-Lan to use: Lan-A, Lan-B or Auto select.

At this point you should be able to see signal from your voice when you talk into the handset while pressing the button in the middle of the handset. Now you have audio going from the station to the Q-sys core, and now we must send the audio out of the core and back to the station. This is how you get the side tone and how you are able to listen to other stations.

AES67 TRANSMITTER



In the AES67 transmitter you will need to fill the following settings

1. **Enable:** used to turn the Transmitter on or off.
2. **Transmitter Name:** This setting is done on the properties tab for the component. We recommend using a name that can be easily related to the station that it belongs to.
3. **Multicast Address:** This is the network Multicast IP that the stream is assigned to. *As default, the transmitter will be something like 239.69.xxx.xxx, however, you will want to give the transmitter a static IP otherwise any time the core re-boots or a design is pushed you might lose your routing from core to the station.*
4. **Stream Name:** A user defined name for the audio stream. This is the name that will appear on the transmitter list in Dante controller.
5. **Interface:** Select which Q-Lan to use: Lan-A, Lan-B or Auto select.

ROUTING AUDIO FROM THE Q-SYS CORE TO THE STATION

Now that you have audio going into the core and leaving the core, you just now need to patch it to the station.

1. Open Dante controller
2. Patch the audio from the AES67 Transmitter to the Dante receiver in the station.
3. Repeat steps 1 & 2 for each station.

The screenshot shows the Dante Controller software interface. At the top, there are tabs for "Routing", "Device Info", "Clock Status", "Network Status", and "Events". The "Routing" tab is active. On the left, there are filters for "Filter Transmitters" and "Filter Receivers", both currently empty. Below these are sections for "Dante Transmitters" and "Dante Receivers". The "Dante Receivers" section is expanded to show four stations: Station-10, Station-11, Station-12, and Station-13, each with an "Rx" label and a green checkmark. The main area is a routing table with columns for each transmitter and receiver. The transmitters listed are Station-10 through Station-23, followed by AES67-TX-Station-1 through AES67-TX-Station-9, and AES67-TX-Station-10 through AES67-TX-Station-13. The receivers listed are Station-10 Rx, Station-11 Rx, Station-12 Rx, and Station-13 Rx. The routing table shows connections between transmitters and receivers, with green checkmarks indicating successful connections. For example, Station-10 Tx is connected to Station-10 Rx, Station-11 Tx to Station-11 Rx, Station-12 Tx to Station-12 Rx, and Station-13 Tx to Station-13 Rx. There are also connections from AES67-TX-Station-10 to Station-10 Rx, AES67-TX-Station-11 to Station-11 Rx, AES67-TX-Station-12 to Station-12 Rx, and AES67-TX-Station-13 to Station-13 Rx.

FIRMWARE UPDATE

All attempts have been made to retain backwards compatibility.

Firmware Update is not a risk-free process, although all precautions have been taken to avoid catastrophic failures. The update should only be performed if needed.

To obtain the latest firmware, please visit our website at www.alcorn.com.

FIRMWARE UPDATE PROCEDURE

The easiest way to update your VCom's firmware is by using our **VPAGE + VCom Utilities** software, also known as VPVC Utilities. This is available for download for free on our website at alcorn.com/support/software

Once open, you'll enter Firmware Update Mode by selecting your V-Com product in VPVC Utilities and clicking "Admin", then "Enter Firmware Update". *If "Enter Firmware Update" is greyed out and not selectable, it's most likely because your VCom has a control IP address of 169.254.XXX.XXX. To change this, Click "BootP" in VPVC Utilities, then the VCom you want to change the control IP of, then you can manually enter in a different IP address for the unit.*

Once Firmware Update Mode is activated (grouped button flashing (1-6, 7-12)) a web browser tab will be launched at your VCom's IP address, and you will see the dialogue below:



Press "Choose File" then select the OS.NEW VCom firmware file and click "Update Firmware" to perform the update.

Update process may take up to a minute to complete. Then, V-Com will restart automatically (blinking LEDs until QSYS is detected). Update complete! V-Com will retain it's current control IP address through this entire process.

Alternatively, you can enter Failsafe Recovery if unable to enter Firmware Update Mode, or if your VCom gets stuck in the firmware update process (see troubleshooting guide at the end of this manual for more info on Failsafe Recovery Mode).

TROUBLESHOOTING GUIDE / FAQ

Have you tried turning it off and on again? If you have a question not answered by this manual, take a look at our Knowledge Base at alcorn.com. We're always updating it with new answers and useful information! If your question isn't answered there, please email us at support@alcorn.com

Q: I CAN'T ROUTE AUDIO

One of the most common issue with routing audio is switch/router/firewall blocking/filtering out multicast traffic required for the PTP protocol. Please disable IGMP snooping and disable any multicast blocking/filtering. Consult your switch/router/firewall manual.

Q: I DONT HEAR AUDIO WHEN TALK ON THE HANDSET. WHAT IS CAUSING THIS?

Make sure that you are pressing the button on the handset when talking. Also make sure that the audio is routed properly. Refer to the audio routing section of this manual for more details.

Q: I CAN'T CONNECT TO A V-COM?

The default network state of the unit is DHCP. A set of IP addresses are needed were each address can be assigned via a network switch that will handle IP address automatically or the use of third-party application like BootIP where the user can assign an IP address manually based on the MAC address of the network interface.

Each V-Com unit has two MAC addresses one for control and the other for digital audio. Our unique ID start as 00:10:46:XX:XX:XX where Audinate unique ID start as 00:1D:C1:XX:XX:XX

It's important to clarify QSC Q-Sys Core based systems and V-Com control IP must be allocated under the same network and subnet.

Q: MY Q-SYS CORE CAN'T FIND MY V-COM. I PRESS A BUTTON/INPUT ON THE V-COM AND NOTHING IS HAPPENING? V-COM COMPONENT IN Q-SYS SHOWS V-COM OFFLINE OR THE ZONES ARE NOT SELECTED WHEN V-COM IS OPERATED?

This answer applies to any issues related to Q-Sys V-Com communication. Any of the following could be the case:

- V-Com isn't properly configured (Incorrect IP and/or subnet, or incorrect router input set)
- V-Com Q-Sys IP reference or remote port doesn't match the network setup.
- There's a firewall preventing broadcast traffic from getting through to the V-Com.
- Configured IPs (Q-Sys, V-Com) are on a different subnet.

Q: FIRMWARE FAILSAFE RECOVERY MODE: HOW DO I RECOVER MY V-COM UNIT FROM A FIRMWARE FAILURE?

A: You can enter Failsafe Recovery Mode to help. This mode should only be entered when the V-Com is on a test bench and is not wired into the rest of the network.

To enter Failsafe Recovery Mode, start with your V-Com unit powered off. Set the Dip Switch #2 to ON (down), then power on your unit, then return Dip Switch #2 to OFF (up) position. The V-Com is now placed on a static control IP of 192.168.0.254, regardless of its settings. Then, update firmware like normal by opening a web browser and going to <https://192.168.0.254>, and follow the prompts. When the V-Com comes back online, it will no longer be at 192.168.0.254, but instead at the last remembered control IP address. If you don't know what that was, feel free to flip dip switch number 2 to on then off again while powered up to reset the unit to factory defaults.

Q: CAN I ADJUST MY PTPV2 VCOM CLOCKING PRIORITIES?

No. You cannot adjust this setting on our VCom or VPage units, but don't fret. Our priority settings fall in the middle of the PTPv2 priority spectrum, meaning if you have a different product such as a QSYS Core, you can set that product to be the grand master based upon its adjustable priority settings compared to the static VPage/VCom priority settings.

Our AES67 enabled VPage and VCom Products (VPage-VP4X, VPage-VPI6K, VCom-VC12X, and VCom-VC16K) PTPv2 clocking priorities are set and are not changeable. They are:

Priority 1: 249

Priority 2: 112

Note: They must sit on domain 0 (DFLT .129).

To ensure our VPage or VCom products are not chosen as a master clock in your system, you must set a different product that you'd like to be the master on your network to domain 0 and Priority 1 to 0 (or just ensure that it is any number below 249). The lower the number, the higher the priority per the BMC Algorithm.

Note: AES67 requires PTPv2, which is not backwards compatible with PTPv1 (which Dante uses).

Best Master Clock (BMC) Algorithm Details:

In a PTPv2 network, one clock is elected as the Grandmaster. The Grandmaster is the clock from which all other clocks will derive their time. The Grandmaster is selected using a process that involves the BMC - or Best Master Clock algorithm. This algorithm takes into account the following information, prioritized in this order:

1. **Priority 1** – the user can assign a specific static-designed priority to each clock, preemptively defining a priority among them. Smaller numeric values indicate higher priority. From 0 - 255. Lowest number wins.
2. **Class** – each clock is a member of a given class, each class getting its own priority.
3. **Accuracy** – precision between clock and UTC, in nanoseconds (ns)
4. **Variance** – variability of the clock
5. **Priority 2** – final-defined priority, defining backup order in case the other criteria were not sufficient. Smaller

numeric values indicate higher priority. From 0 - 255. Lowest number wins.

6. Unique identifier – MAC address-based selection is used as a tiebreaker when all other properties are equal.

For more details on this subject, check out this wikipedia article: https://en.wikipedia.org/wiki/Precision_Time_Protocol

HOW CAN I MAKE MY QSYS CORE THE PTPV2 GRAND MASTER?

By default, the QSYS Core's Priority settings are set to the following:

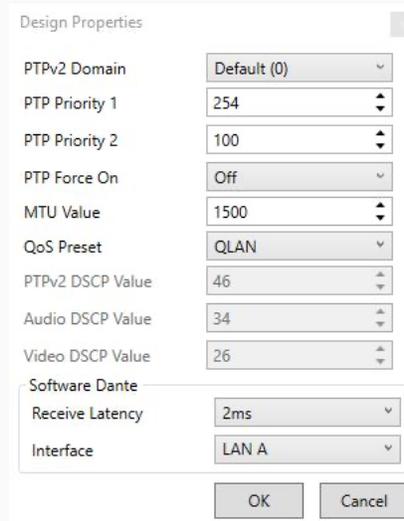
PTP Priority 1: 254

PTP Priority 2: 100

By comparison, our VPage/VCom Priority 1 is set to 249.

This means that if the settings are not adjusted in QSYS Designer, our VPage or VCom units will always win the algorithm, and your QSYS Core will never become the Grand Master.

To change this, all you must do are adjust these settings in QSYS Designer. Go to File > Design Properties.



Here, you can manually adjust the Priority 1 and Priority 2 settings. Again, you'll want to set Priority 1 to something less than 249. You will also want to make sure that your QoS settings on your network match the settings here, otherwise you could experience audio problems and dropped packets.

For more information about PTPv2 and Clocking Priorities in the QSC ecosystem, check out this article: https://q-syshelp.qsc.com/Content/Schematic_Library/design_properties.htm

You can see whom is the PTPv2 Grandmaster in Dante Controller, in the Clock Status tab. Look in the AES67 column for this information. Just note, Dante Controller only lists products that your computer can see on the network.

If you're seeing a VPage or VCom product that is still not relinquishing a master status, It's possible that what you're seeing is a VPage that didn't have AES67 enabled and, therefore, is operating via Dante using PTPv1. It won't release it's master if there's no other device on the network operating in PTPv1. Please confirm that all VPages and VCom units have AES67 enabled so they will all operate on PTPv2 protocol.

LOCATING A V-COM ON A NETWORK

The V-Com hardware contains 1 physical Ethernet connection but 2 interfaces (V-Com control and Dante audio). They are isolated. This means there are 2 MAC addresses assigned to each “physical” V-Com unit hence 2 IPs. Furthermore, on any given network there are most likely multiple V-Com units.

This guide focuses on simplifying locating process of the physical V-Com unit remotely using V-Com Matrix Input, V-Com MAC/IP (control), Dante MAC/IP (audio) and control <-> audio interface matching in a physical V-Com unit. All units must be online (both interfaces) on the same subnet.

AMI Terminal, one of our free pieces of software available for download on our website, is used to send all the commands. AMI Terminal can broadcast across your subnet by connecting to X.X.X.255, i.e. 192.168.0.255. AMI Terminal cannot connect to a Dante audio interface, but it can match by the Dante information stored in the V-Com, hence it can be used to match any given Dante interface information to the physical V-Com including physical identify by the Dante MAC/IP address.

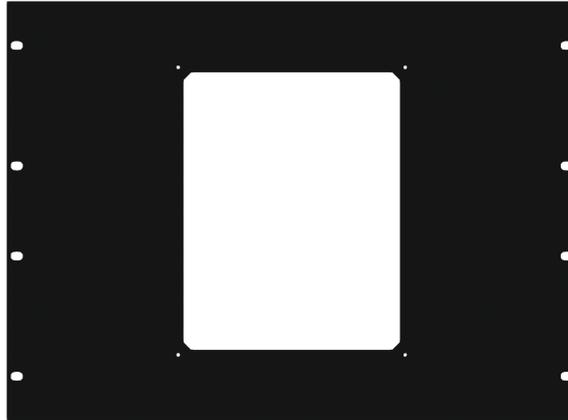
Action	Command	Response	Notes
Pinging all the V-Com Station IDs	“ID” h0D	V-Com Station ID from all the V-Coms online.	ID 99 is a default ID if Link hasn’t been performed.
Pinging all the V-Com IPs	“IP” h0D	V-Com IP from all the V-Coms online.	IP reported is a dynamic IP if obtained via DHCP or static IP, if one is set.
Pinging all the V-Com MACs	“MC” h0D	V-Com MAC from all the V-Coms online.	
Pinging all the Dante MACs	“UMC” h0D	Dante MAC from all the V-Coms online.	
Pinging all the V-Com/Dante MAC pairs	“PMC” h0D	“V-Com MAC, Dante MAC” from all the V-Coms online.	Response contains both of the MACs (V-Com and Dante) from a single V-Com unit.
Physically identifying by V-Com Station ID	“XFN” h0D	“R” from matched V-Com and V-Com physically blinking for a short period of time.	X is the station ID assigned to the V-Com unit.
Physically identifying by V-Com or Dante IP	“X.X.X.XFN” h0D	“R” from matched V-Com and physically blinking for a short period of time.	X.X.X.X is the V-Com or Dante IP address.
Physically identifying by V-Com or Dante MAC	“X:X:X:X:X:XFN” h0D	“R” from matched V-Com and physically blinking for a short period of time.	X:X:X:X:X:X is the V-Com or Dante MAC address.

ACCESSORIES

Please contact sales@alcorn.com for pricing and availability.

RM-VC12

This is an 8U rack mount kit that allows you to mount both a V-Page VP4X and a V-COM VP12X side-by-side into a standard 19" equipment rack.



RM-VP4VC12

This is an 8U rack mount kit that allows you to mount both a V-Page VP4X and a V-COM VP12X side-by-side into a standard 19" equipment rack.



HANDSET-VC

The V-Com VCI6K comes with a push-to-talk handset that's pre-terminated with a 4-pin XLR connector to mate with the panel-mount connector of the station. We offer the HANDSET-VC as a replacement item in case the original is lost or damaged.



SPECIFICATIONS

CONTROL

Controls	12 Pushbuttons /w Integration Green LEDs Receiver Volume Knob
Config Switches	Link Firmware Update/Factory Defaults
Network Connectors	Female RJ45 SFP
Protocols	UDP, TCP, HTTP, Dante, AES67

AUDIO

Handset Connector	Female 4-Pin XLR
THD+N	<0.07%
Signal-to-Noise Ratio	>85dB
Input Impedance	>30Mohm
Frequency Response	20Hz-20kHz +/-1%
Network Audio Interface	1x1 Dante 1x1 AES67
DSP Compatibility	Q-SYS Core 110f (AES67 Only) Q-SYS Core 250i (AES67 or Dante via CDN64 I/O Card) Q-SYS Core 500i (AES67 or Dante via CDN64 I/O Card) Q-SYS Core 510i (AES67 or Dante via CDN64 I/O Card) Q-SYS Core 1100 (AES67 or Dante via CDN64 I/O Card) Q-SYS Core 3100 (AES67 or Dante via CDN64 I/O Card) Q-SYS Core 5200 (AES67 Only)

PHYSICAL

Power (PoE)	PoE Class 3 RJ45
Power (DC)	5-37VDC @ 1A Max Phoenix Terminal Block 1844210
Dimensions	8"W x 10"H x 2"D (204mm x 254mm x 51mm)
Weight	1.5lbs (0.7kg)
Environment	0°C (32°F) to 38°C (100°F) 0-90% Relative Humidity
Compliance	WEEE, RoHS